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Determinants of the Volume of Market Surplus of Forest Coffee Produce and Price Received by Coffee Farm Household in Essara Woreda, the Cause of Dawuro Zone, Southern Nation Natonalits and Peoples Region, Ethiopia

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Abstract
the factors that affect the existing forest coffee value chain of Essara woreda are market surplus production and price received by coffee farm households. To these end 235 sample producers, local coffee collector, local traders, wholesalers and consumers were identified from 9 kebele, Balle and Tarcha town for the study. Based on the findings of the study the volume of production and marketing were found to be affected by age, family size, market Center and all-weather road distance, the level of deforestation and factors that aggravated deforestation, selling price, experience of producer households and mixing forest coffee to garden coffee to increase the volume. About 2% of market surplus coffee is transacted in through formal market while, 98 % is through conventional market, as a result of which producer obtain less income and 98 % forest coffee producer's income source is depending on natural forest coffee production and marketing while, the level of deforestation is too high it needs appropriate intervention and awareness creation.
Keywords: Essara Woreda, market surplus, price

1. INTRODUCTION

Coffee is vital to the cultural and socio-economic life of Ethiopians and it sustains the livelihoods for over 15 million, and provides important income for casual labor for many poor rural peoples. It is estimated that about 20 percent of the total populations, directly or indirectly, depend for their level of living on coffee production and trading (Alemseged-, and Getaneh, 2013)

In addition, coffee in Ethiopia the most significant agricultural produce in the economy in which millions of farmers grow the crop for the livelihood of living. Hundreds of thousands of intermediaries are involved in the collection of the crop from farmers and supply to the domestic and exporters markets to generate income, and a sizable amount of foreign exchange accounting up to 30 percent of the total yearly export income derived from it (Stellmacher *et al.,* 2010). Coffee is very important agricultural commodity with a significant contribution to the growth and functioning of the economy and the social stability of the country and as the main source of the income to tens of millions of small-scale farmers, workers and traders (Alemseged, 2012). It contributes 25%-30% of the country's foreign exchange (FDRE MOT, 2012). According to the Economic Report on Africa (ERA, 2013), coffee contributes about 10% of Ethiopia's GDP and is the country's largest export item.

Ethiopia has huge potential to increase coffee production as it endowed with suitable elevation, temperature, and soil fertility, indigenous quality plantation materials, and sufficient rainfall in coffee growing belts of the country (Abut *et al.*, 2013). Coffee is a shade-loving tree. It grows well under the large indigenous trees such as the *Cordia Abyssinica* and the Acacia species, in two regions of the country Oromiya and southern nation nationality and people regional state. In our country smallholder farmers on less than two hectares of land produces and supply Ninety-five percent of Ethiopia's coffee produces, while the remaining five percent grown on modern commercial farms (USAID, 2010; Taye, 2013).

According to FDRE MOA, 2012 coffee production system in Ethiopia generally categorized in to four areas i.e. forest coffee, semi - forest coffee, garden coffee, and plantation coffee. Forest coffee is a wild coffee grown under the shade of natural forest trees, and it does not have a defined owner. Semi-forest coffee farming is a system where farmers thin and select forest trees to let sufficient sunlight to the coffee trees and to provide adequate shade. A farmer who prunes and weeds the forest area once a year claims to be the owner of the semi-forest coffee. Garden coffee normally found in the vicinity (near) of a farmer's residence. It normally fertilized with organic material and usually inter-cropped with other crops. The government or private investors for export purposes plant Plantation coffee. Fertilizers and herbicides usually used in the coffee plantation farming system. Coffee production system in Ethiopia, forest coffee accounts 8-10 %, semi-forest coffee 30-35 %, garden coffee 50-55 % and plantation coffee 5-10% (Sentayhu, and Taye, 2013).

Forest coffee (*Arabica*) has its center of origin and diversity in Southwestern and Southeastern Ethiopia, where it occurs naturally in the undergrowth of Afromontane rainforests between 1,000 and 2,000 meter above sea level (m.a.s.l). Wild (forest) coffee defined as coffee that grows and regenerates spontaneously in its natural habitat and is genetically different from known cultivars (Christine, *et al.,* 2007). The gene pool of these wild

coffee populations is of national and international important, because it has high potential for the breeding of new coffee varieties. In addition, the original forest habitat of wild coffee internationally recognized for its high plant diversity and large number of endemic species (Gil *et al*., 2004) cited (Christine *et al*., 2007).

The country has an estimated 30% of coffee production originating from forest coffee cultivation systems, and it contributes about 10 % to 20% of the country's total export. Forest coffee has the advantage that it originates from an organic and shaded production area and its productivity, quality increasing important for coffee drinkers worldwide (Taye, 2013). The mountain rainforests in Southern Ethiopia are the only place in the world where coffee still grows wild in its natural habitat. For this reason, these areas require protection. Despite the value and demand for coffee, Ethiopian forest, coffee producers live in extreme poverty. Their livelihood traditionally depends on low-yielding subsistence agriculture and the sale of forest coffee is for consumption level income. Coffee prices are low and highly fluctuating. Simultaneously, Ethiopian coffee forests are experiencing deforestation at annual rates of up to 9%. This is mainly due to the gradual expansion of smallholder agriculture and over-utilization of forest products. There is a trend of extensive wild coffee collection moving towards forest, semi-forest and plantation coffee production. From a coffee producer's viewpoint, the transformation of primary forests into coffee plantations makes economic, sense because coffee generates immediate cash income as compared to other forest services as conceders.

Due to the fact of its organic nature forest coffee market demand increasing at international coffee, market level. 'Currently Smallholders may adopt best agricultural and processing practices to produce specialty grades (no economies of scale or technology barriers to entry). Forest and semi-forest coffee may capture premium prices if properly managed and certified. (UNESCO) has declared them Heritage of Humanity and there is Japanese and German funding to research, measure and promote wild coffee. Private investors both national and foreign are ready to take over state plantations and open up new areas (Sentayhu, 2013).

1.1. Statement of the Problem

Being a center of origin and genetic diversity for Arabica coffee, Ethiopia is an important source of coffee genetic resources for the coffee industry in the world. Coffee grows in different parts of Ethiopia of which, the South and Southwestern regions are homes for Wild coffee. Dawuro zone is one of the areas where coffee co-exists with the native forest. In the zone, coffee is produced in five woredas and forest coffee produced in three of them.

Dawuro Zone have potential in forest coffee and out of the forest coffee produced in the Zone Essara Woreda accounts more than 60% of coffee forest belt and 76 % of annual produce of the zone and supply to conventional and fair trade markets. Out of this 98 % transacted to conventional and 2% by fair trade roots. Even though the introduced Zone and woreda have a huge potential forest coffee, until today there is a gap on knowing the importance of zonal forest coffee potential and its contribution to the central market as well as for the country economy.

For the significant value additions in the coffee sector, provision of agricultural/agronomy and post-harvest services at both growing and harvesting stages, and creation of strong linkages between growers and exporters is necessary (ERA, 2013). While in Dawuro zone there is a gap of knowing on value addition of the produce and agronomic service delivery for forest coffee producers to increase the volume of marketable surplus supplied to conventional and fair trade markets roots and to encourage the producers. Establishing the link between different actors to add value and to make the transaction root smooth is not clearly defined in the area.

The main aim of a value chain is to produce value added products or services for a market, by transforming resources and by the use of infrastructures, within the opportunities and constraints of its institutional environment. Therefore, constraints for value chain development are market access (local, regional, international) and market orientation (Grunert *et al.,* 2005), available resources and physical infrastructures (Porter, 1990) and institutions such as regulative, cognitive and normative (Scott, 1995 cited by Jacques, 2011).

The forest coffee producer of Essara woreda face constraints such as faraway from all-weather road on average 62.5 km and they have no chance to force local collectors and trader's price setting and exploitation at farm get level as result of central market center distance and lack of all-weather road access. The market and marketing system of the area is dominated by conventional (informal marketing) system and producers are forced to sale directly for conventional transaction root for local collectors and traders and they have been not getting premium price for their produce until today. The introduced drawback in the area affects the produce value additions and the producer's performance.

The core problem of forest coffee Producer farmers in Essara woreda are: producers are economically very poor, they practice traditional coffee harvesting system, and they obtain low produce and quality coffee. Then the income the producers generate from natural forest coffee picking is not sufficient for their livelihoods and each year they migrate to Jimma zone to be employed as seasonal labour during coffee harvesting season, while factors that forced them to migrate in search of seasonal off farm income alternatives are not well studied, analyzed and documented in the area.

Free-riders from a nearby community slashing not fully matured coffee in harvesting process (FARM Africa, 2006). In the some way there is high competition between forest coffee pickers, in the woreda and not matured coffee cherry were harvested early harvesting season between ends of Augest to beginning of October because there is no governing rule for forest coffee belts how to produce and manage. Than they sale it at lower price for local collectors and it makes their livelihood worse for ever. The above noticeable problems made the producer farmer in the woreda under poverty for long period of time and miserable life of living conditions. The possible mitigation strategy to improve their livelihood is government and non-governmental organization intervention in coffee value chain function improvement with related to value addition system, alternative market creation, off farm income source building strategy development and implementation is necessary intervention. Regarding the noticeable problems, there is no scientific study to date conducted in the zone and woreda concerning forest coffee.

The natural forest coffee of Essara Woreda exists in the evergreen natural forests of Nada, Bubayilga, (Gudumu), Chawda, Shota, Churichura, and Zadishemite, zadiwoyda, Hageli, Yinbira, Shadatela, guza and Daliba kebele. In addition, Chabara-Churichura national park, which is new national park in Ethiopia and the Zone, find in between Essara and Tocha woreda from Dawuro Zone and Konta Special Woreda in the same region and it has total area of 1,190 km^2. The Chabara-Churichura National park is concentrated evergreen natural forest and full of natural forest coffee under the canopy, whereas the park area forest coffee potential, importance and productivity level is not studied scientifically until today. The total coffee forest coverage undertaken in this research is estimated to be more than79km^2 circumference including part of Chabara Churichura national park. In addition, the Chabara-Churichura National Park forest shares direct boundary with Kaffa Zone natural coffee forest belts. However, the link between Dawuro and Kaffa natural forest coffee has not been studied to date.

For optimal forest management for coffee production and biodiversity conservation, capacity building practitioners through training, baseline inventory of forest conditions, initial opening or clearing, weeding, enrichment planting, monitoring and rehabilitation of degraded forest areas is important intervention (Tadesse *et al.,* 2008).

Out of the natural forest in the Essara woreda, community owns more than 99% of the resource without governing rules and regulations. It creates high competition between free riders on resource over utilization in the area and accelerates deforestation; while there is no study to date regarding the resource use and management in the area, who controls the production, sits in advance, and the effect on marketable surplus production potential is not studied. The remaining around 1% is owned by micro-enterprise organized youths and kebele administration within participatory forest management (PFM) program and preserved resources but their efficiency and contribution to increase the volume of marketable surplus coffee augmenting role is not properly defined.

Even though there is amusing, coffee genetic resource that could be used for improving the livelihood of people in the area, serve as a pool for future coffee improvement, and many other benefits, it is a pity that there has been no comprehensive study made regarding the forest coffee in respect of its variety, quality, management, volume of coffee produced and its contribution to regional and international markets. Moreover, there is hardly information gap pertaining to how coffee from the forest is collected and sold along the value chain, amount produced and supplied to the local market, and its trading channel legality. To organize the strong documentation regarding the major actors along the chain and their respective roles, what values they add and margin they receives form natural forest coffee produce of the area, needs analysis, to be source information for farther study and for policy makers, defining the area resource potential is important. In addition, forest coffee producers are facing problems that relate to the unit price, market and marketing information, infrastructure shortage, and low share benefiting from their produces. In general, there is no study to date that indicate the analysis made on the existing forest coffee value chain in the area in order to identify the major challenges and recommended ways of solutions to establish an efficient and sustainable forest coffee production and supplying to local market. The market chain that can ensure fair margin to all actors in the value chain needs appropriate analysis for all actors participated in the channel.

In Ethiopia coffee producers characterized by predominant traditional production system, weak/no linkages among stakeholders, little market promotion & incentive mechanism, inadequate services (credit, inputs, seeds, equipment's…), little price share/benefit to poor producers), fair-trade & sustainability is under question (Taye, 2013).

In the world market, fair trade coffee holds only a small share compared to conventionally marketed coffee. For example, in Europe and the United States, fair trade coffee comprises only 1–2% of sales, with the notable exceptions of 20% in the United Kingdom and 6% in Switzerland (Berhanu *et al.,* 2009).

In the someway Essara woreda forest coffee producers sale 98 % in conventional and 2 % in fair trade market. The level of benefit and income generating capacity is very poor. In addition to these, the coffee price set by traders and collectors rather than producers, and then the income gain level of producers is very poor as

compared to local collectors, traders and wholesalers. Therefore, the above challenges and bottlenecks result in low benefit share for the smallholder farmers producing forest coffee in the woreda and poor standard of living. As a result, farmers in the area are forced to depend on subsistence crop production for home consumption especially perennial crop such as "Enset" rather coffee. In view of the aforementioned problems, this research will assess the existing scenarios of the forest coffee production and marketing channel in the study area. Therefore, in order to develop a novel value chain that can be benefit the smallholders, it is imperative to investigate the existing value chain of forest coffee in the area and come up with possible solutions and recommendations that may contribute to policy issue in the country.

Therefore, this research will address to fill the gap of knowing of forest coffee potential of the area and its economic value and how the smallholder farmers will get the premium coffee price by collectively and individually from the natural and organic verity of the woreda coffee resource. In addition, what factors affect the coffee value chain, who acts what or chain actor's role and the intervention mechanism needed in the area to sustain the value addition of forest coffee and its market and marketing margin analysis have been addressed to fill the gap.

1.2. General Objective

The general objective of this study is to analyze the factors that affect the existing forest coffee value chain of Essara woreda.

1.3. Specific Objectives

1. To identify the determinants of the volume of market surplus of forest coffee produce and price received by coffee farm household in Essara woreda

1.4. Research Questions

This study has tried to address the above research objectives through answering the following basic research questions.

1. What does the existing value chain channel look like? Who are the actors? What activity do they perform? Is there value addition as the produces moves along the chain? What factors affect it?
2. What is the amount of coffee supplied from the study area? What is the price charged by the different value chain actors? Who sets the price for forest coffee along the chain? Do actors receive a fair margin that takes into account their cost and roles played along the chain?

1.5. Scope and Limitation of the Study

The scope of this research is to investigate the volume of production and marketing channel of Essara woreda forest coffee at different destination or from producer to final consumers by analyzing its production and marketing situation, price setting power holder of the chain actor, marketing and its margin along producer and traders, and factors that hinder the volume of market surplus production in the area. The study concentrated on 9 of coffee producing kebele in Essara Woreda and restricted to sample size of 150 forest coffee producers (pickers) 20 local coffee collectors and traders, 15 road side, café and hotel boiled coffee venders 10 Wolayta Sodo and Jimma town administration wholesalers and 40 local consumers in its respective area and summarize the obtained data as representative to the population of the study area.

The limitation of this study was it covers only one woreda forest coffee volume of market surplus production, its chain actors and factors that affect it out of three forest coffee producers woredas in the zone as result of budget and time constraints.

1.6. Significance of the Study

Most of the coffee produce in the study area comes from forest coffee and it is source of income for different actors. Producer farmers who depend on the forest coffee production and marketing for their livelihood in the area face different types of challenges. These challenges are related with poor coffee production system, harvesting and post-harvest management system, transporting to market center and method of transport, and benefit obtained from the produce. To date strategies have not been considered in order to alleviate the existing challenges has been not considered until today. The role of major actors in the chain is not well recognized. However, this study has tried to provide a generalized picture of existing forest coffee value chain and its challenges associated with producers, traders, wholesalers, and consumers by identifying the method of intervention direction for chain actors to minimize the challenges.

Empirical data generated from the present study will have paramount importance in promoting sustainable forest coffee volume supply of marketable surplus production. The Woreda has no study before regarding the volume of marketable surplus produced and supplied to the market chain and the channel structure and performance of forest coffee in the area not supported by any scientific research to encourage producers and

traders until today. As outcome, the finding of this study information will be documented and made available to relevant institutions pertaining to as source information of the existing production and marketing channels of the zone, major actors and their respective roles performed to increase the volume of forest coffee production and transaction behaviors indicator data analysis and interpretation documented properly for farther users. This in turn may help to lead to identification of challenges for future intervention in establishing an efficient production and marketing channel of forest coffee. The study is also helpful in analyzing the gender division of labor along the forest coffee value chain and the share of benefit between male and female. The indirect beneficiaries from the study include producers, traders, consumers, research and development organizations, policy makers, local coffee value chain supporters, governmental organizations and NGOs who aim to improve the performance of forest coffee value chain in the study area and the output of this study may also helpful for:
It can helps planners and policy makers as an input for designing the relevant intervention measures that help to develop a novel value chain.

1) It can provide input for development programs on how they can direct their intervention programs towards the development of novel value chain of forest coffee in the area.
2) Farmers and other actors can benefit indirectly from the intervention programs and policies which could arise from background information obtained from this study.
3) It can serve as a background information source for farther and detailed research, on coffee value chain at the regional level.

1.7. Organization of the Study

The remaining part of the research thesis organized in to five chapters. The logical foundation of the theoretical and empirical literature of forest coffee value chain analysis are well discussed in chapter two and chapter three discuses about method of data collection and its methodology design .Then chapter four shows as results and its dissection based on chapter two and three. Chapter five contains conclusion and is the final chapter, it depicts conclusions and policy implications based on the research findings.

2. LITERATURE REVIEW

2.1. Theoretical Review

Ethiopia is the second-largest exporter of organic coffee by volume, after Peru. While, the market size for organic coffee is small, comprising only about 1% of the total coffee market and certification organic coffee needs several criteria and it can be sold through both conventional marketing routes and fair trade routes Svein, *et al.,* and (2009). The international nature of coffee marketing and sales directly exposes coffee producers in developing countries to international price fluctuations and primary cooperatives and cooperative union carry fair trade Birhanu, *et al.,* (2009)

Value chain describes the full range of activities which required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use (Kaplinsky, and Morris, 2000).

Value chain is the interlinked value adding activities that convert inputs into outputs that in turn, add to the bottom line and help to create competitive advantage. A value chain typically consists of inbound, distribution or logistics, manufacturing operations, outbound distribution or logistics, marketing, selling and after sales service. These activities supported by purchasing or procurement, research and development, human resource development and corporate infrastructures. Value chain describes the full range of value-adding activities required to bring a product or service through the different phases of production, including procurement of raw materials and other inputs, assembly, physical transformation, acquisition of required services such as transport or cooling, and ultimately respond to consumer demands (Raphael, 2000; Kaplinsky, 2002).

It includes all of the vertically linked, interdependent processes that generate value for the consumer, as well as horizontal linkages to other value chains that provide intermediate goods and services. It refers to the process of continued addition of value that occurs while the product passes from one actor in the chain to the next, gradually increasing its degree of transformation. While “supply chain” encompass every logistical and procedural activity involved in producing and delivering a final product or service, “from the supplier’s supplier to the customer’s customer” (Feller, *et al.,* 2006). Since the primary focus of supply chains is efficiency, the main objectives are usually to reduce “friction” that reduce overstocks, lower transaction costs, and improve fulfillment and customer satisfaction. Therefore, a value chain is not the same as a supply chain. It is about linkages generating value for the consumer. While a supply, chain is about processes of moving and transforming commodities into products from producers to consumers. A value chain is about generating value for the consumer; a supply chain is about logistics. The issue is which concept is superior or preferable, since they are complementary and their effective implementation can deliver improved business results.

Value chains therefore, encompass all of the factors of production including land, labor, capital, technology, and inputs as well as all economic activities including input supply, production, transformation, handling, transport, marketing, and distribution necessary to create, sell, and deliver a product to a certain destination, on value creation typically via innovation in products or processes, marketing and allocation.

A value chain is an alliance of enterprises collaborating vertically to achieve a more rewarding position in the market. Vertically aligned means that companies were connects from one end of the primary production process (e.g., farmer's field), through processing, and possibly into the final marketing stages where consumers purchase a finished product. At each stage, the products value increases. Normally, the term value chain applied when the vertical alliance includes three or more companies, known as links, in the supply chain (Nisku, and Alberta, 2004). Value chain analysis can be a participatory and empowering process. Using maps and diagrams enables even poor and disadvantaged stakeholders to be involved in the collection and analysis of information. This promotes dialogue and accountability between stakeholders as they analyze and negotiate their common interests in improving the functioning of chains and identifying those interventions likely to be most useful.

The Ethiopian forest coffee varieties have a unique flavors, and its long deep cultural appreciation of good quality coffee, and its traditional organic, shade-grown and bird-friendly production made it highly demanded by local and international consumers. Small-scale land owners and forest coffee producer farmers provide large share of coffee to domestic and international markets and its comparative advantage in the international specialty coffee market is too high. While to achieve global competitiveness, the coffee industry requires improvements in three areas: efficiency, product differentiation and response to specialized market demand. Decision makers are increasingly face with the challenge of reconciling growing demand for agricultural output and low agricultural production in developing countries. Efficiency measures whether resources (in the form of labor, capital, or equipment, etc.) being used to get the greater output. Adopting the criterion of economic efficiency implies that society makes choices, which maximize the outcomes gained from the resources allocated. Inefficiency exists when resources could reallocate in a way, which would increase the outcome produced. Technical efficiency refers to the physical relation between resources and outcome. A technically efficient position achieved when the maximum possible improvement in outcome obtained from a set of inputs. An intervention is technically inefficient if the same (or greater) outcome could produce with less of one type of input. Technical efficiency cannot, however, directly compare alternative interventions, where one intervention produces the same (or better) outcome with less (or more) of one resource and more of another (Torreon, and Palmer, 1999).

Value chains is a conceptualize enterprises and economic activities, not as separate discrete units or functions, but as part of chains, holistic networks and systems of different linked production and exchange activities operating in different geographical areas: local, national and international(Linda, and Grania, 2008).

A value chain is a sequence of target-oriented combinations of production factors that create marketable product or service from beginning to the final consumption. This includes activities such as design, production, marketing, distribution and support services to the final consumer. The activities that comprise the value chain can be contained within a single firm or divided among different firms, as well as within a single geographical location or spread over wider areas. The term Value Chain refers to the fact that value is added to preliminary products through the combination of other resources Andreas, *et al., (*2011).

Gender differences and inequalities operate at all levels of the value chain, affecting not only women's rights, but also pro-poor development goals in general. Gender ministering therefore requires addressing many interlinked and mutually reinforcing dimensions (economic, social and political) and levels (individual, household, community, national, and international) on which gender inequality operates within the value chain (Linda, and Grania, 2008). Gender equality and women empowerment in forest coffee production and marketing value chain is very essential to poverty reduction by adding value of coffee, job opportunity creation to accelerate economic growth and resource owning and decision making capability building of female in the area has analyzed in detail in this research.

Coffee is one of the most important traded commodities in the world. The sector's trade structure and performance have large development and poverty implications, given the high concentration of production by small-holders in poor developing countries. Coffee's global value chains are quickly transforming because of shifts in demands and an increasing emphasis on product differentiation in importing countries (Ponte 2002; Daviron and Ponte 2005). There is a growing willingness-to-pay for premium, high quality coffee by rich consumers and the demand for specialty and certified coffee is on the rise.1 Moreover, international coffee markets have experienced significant price variation over the last decade prices were five times higher in 2011 than in 2002 Bart Minten *et al.,* (2014).

These changes have important implications for a number of the poorest developing countries, as most coffee production takes place in these countries, even though most coffee consumption is in developed countries (Pendergrast, 2010; Ponte, 2002). While there are a number of studies that have looked at price formation for different types of coffee at the retail consumption level in importing countries (Teuber and Herrmann, 2012),

important questions remain on who benefits from this increasing willingness-to-pay for coffee and on how changes in global coffee markets are transmitted to producing countries. Moreover, few researchers have looked at how domestic policy change is affecting the performance of the coffee sector in these exporting countries (Bart Minten *et al.,* 2014).

In this paper, we look at the structure and performance of the coffee export sector in Ethiopia. In 2012, Ethiopia exported 3.2 million bags, making it the most important African coffee exporter and the tenth largest ex-porter in the world (ICO, 2013). Its share of the international coffee trade that year was about 3 percent. Coffee is the most important export product of the country, accounting for about a quarter of the value of all exports in 2012. Coffee is cultivated by over 4 million primarily smallholder farming households (CSA, 2013) and, with those employed in ancillary activities to coffee production, even more households are dependent on coffee for part of their livelihoods (LMC, 2003). Furthermore, coffee plays an important role in social gatherings and is important in local consumption, as more than half of Ethiopia's coffee production is consumed locally (CSA, 2013).

A marketing margin may be defined alternatively as a difference between the prices paid by

Consumers and that obtained by producers or; the price of a collection of marketing services that is, the outcome of the demand for and the supply of each service (Tome and Robinson,

1990). The size of market margins is largely dependent upon a combination of (1) the quality and quantity of marketing services provided; (2) the cost of providing such services; and (3) the efficiency with which they are undertaken and priced (Scarborough and Kydd, 1992). For instance, a big margin may result in little or no profit or even a loss for the seller involved depending upon the marketing costs as well as on the selling and buying prices (Mendoza, 1991). However, under competitive conditions, the size of market margins would be the outcome of the supply and demand for marketing services, and they would be equal to the minimum costs of service provision plus "normal" profit (Scarborough and Kydd, 1992; Mendoza, 1991). Therefore, analyzing market margins is an important means of assessing the efficiency of price formation in and transmission through the system (Scarborough and Kydd, 1992).

There are three methods generally used in estimating marketing margin. (1) Detailed analyses of the accounts of trading firms at each stage of the marketing chain (time lag method); (2) computations of share of the consumer's price obtained by producers and traders at each stage of the marketing chain; and (3) concurrent method: comparison of prices at different levels of marketing over the same period of time (Scarborough and Kydd, 1992).

The gender differentiated impacts at the levels of the household (both in relation to decision making and workload), in relation to access to producer organizations, services, markets and the overall upgrading strategy employed interventions is to facilitate smallholders participation in new 'sustainable' value chains (Lone Riisgaard *et al.,* 2010). In Essara woreda gender roles in forest coffee production, processing and marketing channel, though different, are not documented by considering the role of female and activities performed by them in forest coffee value addition, decision making power to produce, sale and enjoying the benefit share in household level.

Different scholars define that, market structure identifies that how a market is made up in terms of the number of firms in the industry, the nature of the product produced, the degree of monopoly power each firm has, the degree to which the firm can influence price, profit levels, firms' behaviour, pricing strategies, non-price competition, output levels, the extent of barriers to entry the impact on efficiency of firms in the industry. Whereas, the level of market structure and performance, share of benefit among producers and traders of Essara woreda forest coffee producers and traders who participating in forest coffee transaction in the area has not scientifically defined according to their level of market concentration and margin share.

2.2. Empirical Review

The case of forest coffee value chain in Bench Maji and Kaffa zone in Ethiopia identified that the Ethiopian forest coffee producers live in extreme poverty and their livelihood depends on traditionally low yield, its price is low and highly fluctuating. Simultaneously, Ethiopian coffee forest characterized annual rate of 9% deforestation and which helps to aggravates poor productivities. The suggested strategy is that promotion and sustainable forest management related to environmental services is needed (Ulrike *et al., 2010*). In forest coffee market chain participants are numerous and include smallholder coffee farmers or state farms, primary collectors (Sebesabwoch), suppliers (Akrabiewoch), processors, service cooperatives, unions, exporters and various government institutions (USAID, 2010).

Forest coffee certification helps its promotion and it depends on the costs and returns of individual actors in the value chain which influenced by different product characteristics, like quality or seasonality and fire trade. Fair trade approach is clearly social and economic development system in forest coffee value chain and it also involves on environmental concerns (Stellmacher *et al.,* 2011).

Market chain of forest coffee in south western Ethiopian studied by Zekarias, *et al., (2012*) was

assessed the existing market structure, conduct and performance by examining the chains cost, profitability, and determinants of the supply chain. The studies come up with results and findings of on average 9,784 and 4,721 coffee trees owned by a single producer in Gera and Shebe have obtained a yield 1,091 and 850 kg/ha respectively. And market structure assessment of the study show as producer, assembler, wholesaler, and retailers are main actors. Local coffee wholesaler's concentration index indicates 40.85% and 29.69% respectively and there is a threat of oligopoly in the market structure especially in Gera area. The price-setting mechanism in the producers market is largely determined by the benevolence (goodwill) of buyers. Whereas the existing market demand and supply are the major determinants of price setting and the margin analysis indicates 50.98% take the largest profit margin in the coffee market chain. The ordinary least square regression analysis of the study pointed out the price; educational level of household, transportation cost and level of production have a significant impact on the supply chain of forest coffee according to the study.

According to Ponte (2002), value chain analysis is used to examine the impact of new consumption patterns and evolving corporate strategies in the global coffee chain on the coffee exporting countries in the developing world. The study concluded that the coffee chain was increasingly becoming buyer-driven and the coffee farmers and the producing countries were facing a crisis relating to changes in the governance structure and the institutional framework of the coffee value chain.

According to Dereje (2007), value chain approach used to study the competitiveness of Ethiopian coffee in the international market. The study specifies that Ethiopian farmers have low level of education, large family size with small farmland and get only 3% of the retail price in the German market. Hence, appropriate policy intervention was suggested to improve farmers' performance.

The study conducted by FARM Africa (2006), forest coffee baseline data Study in three Woredas of Kaffa Zone, used as general objectives of integrate and improve coffee production and marketing. The study applies the best of possible options; to generate and distribute net benefits to members. The study come up with findings that judicious to conduct a brief market study and implement price differentials for quality coffee supplies (deliveries) by Union-primary cooperatives member farmers and local traders operating at kebele association levels. Furthermore, the Union should attend to the farmers' credit requirements through the banking system. In this respect, the Union members should get short to medium-term credit, on basis of their real need for funding and bank requirements, without any other strings attached according to the study results.

The study conducted by Eskinder, *et al.,* (2001), analyzed the Potential Market of China for Ethiopian Coffee and Chinese potential market for all coffee exporter countries in general and for Ethiopia in particular. The study used a methodology Coffee demand and market analysis in China and Ethiopian coffee product and market overview analysis. The best opportunity the study notice here is the Chinese coffee demand increased by 30%. Likewise, the purchasing power of the people is increasing dramatically. These are the best opportunity for Ethiopian Coffee exporters to join Chinese market is the study finding.

The study conducted by Promar (2011), focuses on a high-value agricultural crop and looks at how a high-value agricultural industry contributes to poverty elimination. The study analyzed production, processing and trade related issues. Ethiopian forest coffee is one of the high value produce and the study targeted coffee in Tanzania and Ethiopia by analyzing Japanese coffee market structure, as well as the import volume and prices, by emphasizing the positions of Tanzania and Ethiopia market chain. The study deeply argued that introducing fire trade opportunity and aiding Ethiopian coffee marketing chain in Japan and Germen help further develop the coffee industries and improve the lives of coffee producers in Tanzania and Ethiopia. The study summarizes the challenges for the coffee industries in the two producing countries, especially in market demand in Japan related to coffee value addition problems.

Value chains have been accepted as an effective way of focusing on measures to improve the scale and impact of private sector investments, which include the investments made by smallholder farmers themselves as well as those made by larger-scale domestic or foreign agribusiness investors (Mima and David 2012).

3. METHODOLOGY OF THE STUDY

3.1. Description of the Study Area

3.1.1. Dawuro Zone

Dawuro lies in between 60 36' to 70 21' north latitudes and 360 68' to 370 52' east longitudes. The Gojeb and Omo rivers circumscribe and demarcate Dawuro from northwest to southwest in a clockwise direction. Dawuro shares boundaries with Konta Special Wereda in west, Jimma zone (Oromiya Region) in northwest, Hadiya and Kambata-Tambaro zones in northeast, Wolayta zone in east and Gamo-Gofa zone in southeast. Dawuro has an area of 4,436 km square it has five Woredas, and one Town administration namely Essara, Tocha, Maraka, Genabosa, Loma and Tarcha Town Administration.

The landscape of Dawuro is mostly mountains, plateaus, deep gorges and low land plains. Some of the mountains are Essara, Shasho, Sharo, Gugi, Gazo, Gumati, Hayo, Athso saddle mountains, Hathsinga and Gulo. The plateau cover areas extend from Gora upland in Loma Wereda to the border of Konta Special Wereda in

east-west direction and from Waka town to the confluence of Zigna, Mansa and Omo rivers in north-south direction of Essara and Tocha Woreda. The altitude of Dawuro ranges, from 500 meter around the confluence of Mansa and Omo rivers in special area Bona-balala of Adabacho kebele in Essara Woreda to 3,000 meters above sea level (a.s.l.) at Tuta in Tocha Wereda. Thus, Dawuro exhibits climatic variations from lowland to highland. Dawuro enriched with a variety of trees and plant species and natural vegetation/forest. For instance, Chabara-Churichura National Park, natural forests along Gojeb and Omo rivers valleys and other bigger rivers in the zone such as Mansa, Zigna and Gelo revisers in Essara and Tocha Woreda contain a large number of natural vegetation that is important for bio diversity farther investigations. Dawuro also endowed with perennial rivers whose springs are the highlands aforementioned. Some of the bigger rivers include Buk'a, Shata, Wuni and Zayiri in Mareka Woreda, Wogayi, Zigna, Dibisa, Yarda, C'awa, Shepa in Tocha Woreda Zo'a, Kotoro, Panta, Koma, in Genabosa Woreda, Karethsa hatsa, Mawula, in Loma Woreda, and Mansa, Dalta, Gelo, Sumbursa, Dema, Chawa, Solantya, Banja, and Chofere small lake in Bubayilga, which is found in research conducting Woreda natural forest area are some of it. All these rivers and others of Dawuro are tributaries of Gojeb and Omo rivers.

Dawuro people belong to Omotic family. The language of Dawuro people is Dawurotsuwa (in Latin orthography). Since 1994/1995, Dawurotsuwa has been serving as a medium of instruction in school from grade 1 through 10 grades as a subject and oral communication in the Zone's different government offices.

In 2014, the population of Dawuro nationality estimated to be 600,121 according to annual statistical abstract of CSA and reported by BoFED of SNNPRS and its population density is 135.28 people per square kilometer. While, Dawuro were been not well known by most Ethiopian and western scholars until now while, the nation endowed in its remarkable history and fascinating culture and their heritages. Among the heritages, two amazing ones are the king Dawuro (kawo Hlala) Great defensive Walls and the longest woodwind musical instrument in the world locally called "Dinka" (4 to 5 meters long, and four in number) are the main one. Dawuro had been a highly centralized powerful independent Kingdom, until Emperor Menelik incorporated it into Modern Ethiopia in 1891. The area under cultivation estimated to be 100,395 ha of the total 446, 082 ha area of the Zone according to the zonal agricultural department unpublished data. The dominant crops growing around the study area are Enset (*Enset ventricosum*) maize (*Zea Mays*) coffee (*Coffea arebica*) wheat (*Triticum aestivma)* barley (*Hordeum vulgare)*, pea (*Pisum sativum*), bean (*Phaseous vugaris*), potato (*Solanum tuberosum*), Tomato (*Lycopersicum esculentum L.*), onion (*Allium Cepa .L*) and different fruits and root and tuber crops as well as spices and herbs according to Dawuro zone agricultural department socioeconomic data and own survey interview and practical observation in research conducting zone.

In Dawuro zone coffee is produced in all of the Woreda and forest coffee produced in three of the five woredas and its production, harvesting, postharvest management system, topography and culture of Dawuro people are almost all similar throughout the zone. The similarity of people in all activities leads to conclude that the research conducting Woreda results and outcome can represent other woredas in the zone. While the resource potential and utilization varies from Woreda to woreda due to different reasons. This research focused on Essara Woreda, which is representative of the remaining woredas in the zone, because it covers large share of forest coffee belts, and annual production in the zone.

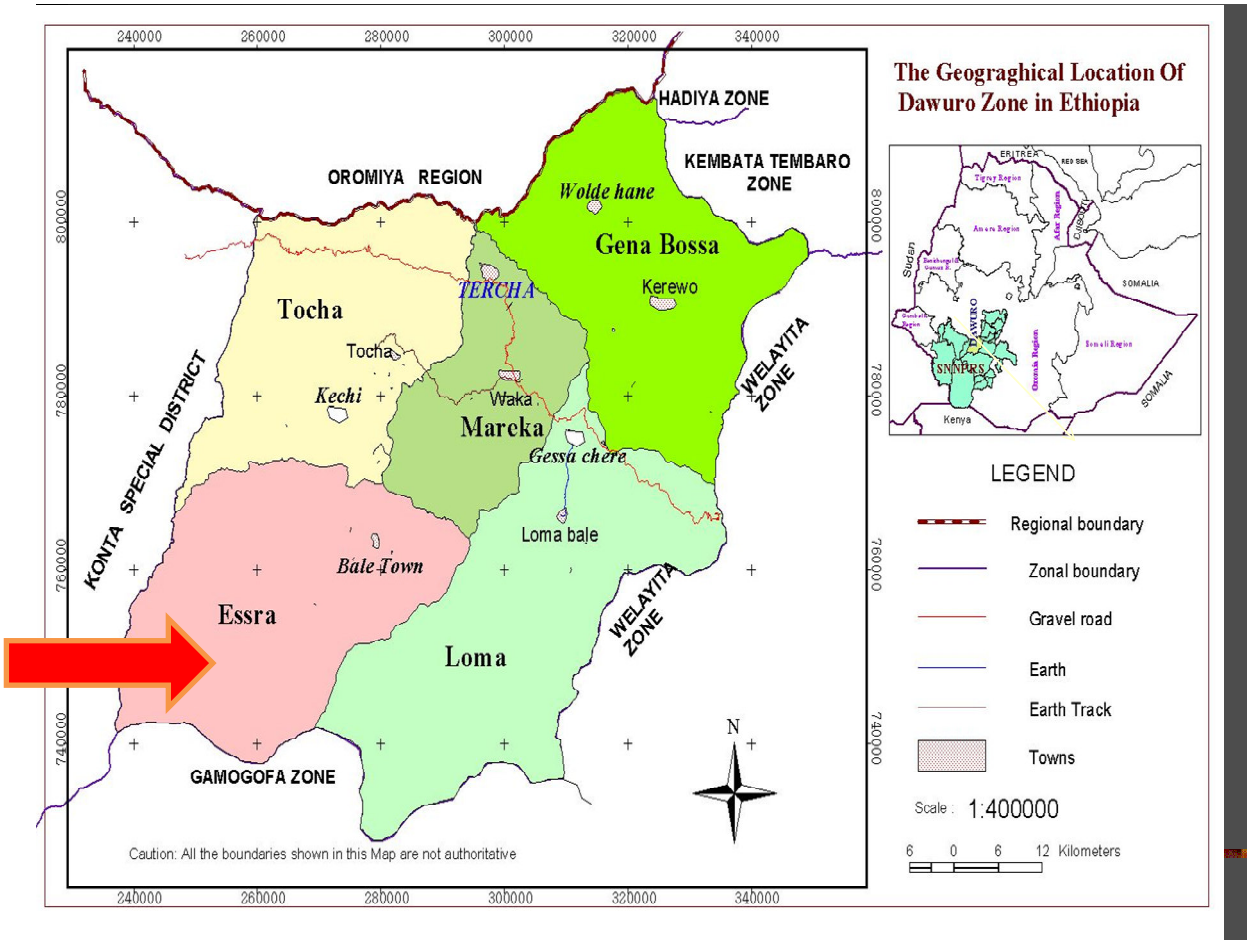

Figure1: Map of Dawuro zone and the study area, Essara Woreda
Source: Dawuro Zone planning and finance department

3.1.2. Essara Woreda

Essara Woreda is one of the five Woreda in Dawuro zone and it has total population of 79,508 out of this 40,183 are male and 39,326 are female and total households in the Woreda are 16,226, according to central statistics authority (CSA) annual statistical abstract and geographical information system (GIS) data of bureau of finance and economy development of SNNPRS 2013. The Woreda has 29 kebele and its population density is 76.2 people per square kilometer. The survey data of this research show that the total populations of the forest coffee belts catchment of nine kebele are 30,115 and total households are 6,146. (Table1).

Table 1Population size and coffee forest distribution in research conducting nine kebeles of Essara Woreda

No	Name of the kebele	Coffee forest Name In kebele	Total population	Male	Female	Households
1	Hagel 02	Abo Tabala	3851	1887	1964	786
2	Guza	Gogaro	2102	1030	1072	429
3	Zadishemite	Shemaite	3251	1593	1658	663
4	Zadiwoyda	Daliba	2105	1031	1074	430
5	Daliba	Chaka	2981	1461	1520	608
6	Yinbira	Shemera	2946	1444	1502	601
7	Sengety	Sharada	3615	1771	1844	738
8	Neda	Usuntha	5565	2727	2838	1136
9	Gudumu	Dengelia & Bubayilga	3699	1812	1887	755
	Total		30,115	14,756	15,359	6,146

Source: Own survey data from each kebele administration, 2014

agro ecology of the Woreda varies from low-land (500 meter a.s.l) in confluence of Mensa and Omo river to 2600 meter a.s.l in Bandaramariyam (Gudumu kebele) and the Woreda including Dega or high altitude 24% (25,034.4 $m^{2)}$, Woynadega mid altitude is 45.2 % (47,148.12 m^2) and Kola or low altitude is 30.8 % (32,127.48 m^2) and totally 104,310 m^2. Land type and utilization according to the data obtained from Essara

Woreda agricultural office, seasonal crop land 19,646.3m^2 (18.84%), perianal crop land 8,252.31m^2 (7.9%), forest and bush land 32,005.4m^2 (30.68 %), communal grazing land 9,999.43 m^2 (9.59 %), potentially productive free land 21,003.6 m^2 (20.14 %), non-productive land 4,501.3 m^2 (4.32 %) and water body and others is 8,901.62 m^2 (8.53 %). Therefore, nine of forest coffee grown kebeles purposefully selected as adaptive trial sites for this research. Of five woredas in the zone, three of them are forest coffee producers and have suitable agro ecology for coffee production. From three Woredas, Essara selected for this research because of its unique potential forest coffee produce in the area which is (2612÷ 3432) = 0.76 or above 76% of the Dawuro zone forest coffee produce supplied to national and international market annually as compared 12 % to Tocha and Mareka Woreda respectively see table 2 blow and this finding of the current survey show that annually average marketable forest coffee supplied by survey contacted 150 farmers in Essara Woreda show that 1,122.2 quintal averagely in each year from 2010 - 2014 coffee harvesting season as the data obtained from individual forest coffee producers interviewed in own survey period. Therefore, a large amount of forest coffee produce is supplied to local market and large share of it is sourced to national market by conventional trade transaction system. As the data obtained from Dawuro zone agricultural department, coffee producer woredas marketing potentials for the last five years in average per woreda per year marketable surplus volume of production and supply ranks as follows:

Table 2: Forest coffee production potential distribution in five woredas of Dawuro zone, between, 2010 and 2014

Category	Essara	Tocha	Maraka	Gena bosa	Loma	Tarcha	Total
Total area of the woreda (km$^{2)}$	1,043.1	779.8	467.7	937.1	1200.3	8	4,436
Total coffee land (ha)	3,780	2476	2428	3605	3277	-	15,171
Forest coverage in (ha)	540	684	486	-	-	-	1,710
Annual coffee production (100 kg)	7,975	1170	7205	6429	5352	-	38,661
Share of forest coffee (100 kg)	2,440	1050	2430	-	-	-	4,920
Annual marketable volume (100kg)	3,189	4,680	2882	2174.4	2141	-	15,066.4
Annual sale (100kg)	2,612	420	400	-	-	-	3,432
Annual consumption (100kg)	5,410	7,020	4323	3857.1	3211	-	23,815.16
% of annual sale	76	12	12	0	0	-	100

Source: - Dawuro zone agricultural department, coffee development tem, annul data, 2014.

Note: % of annual sale of each woreda was calculated as annual sale in quintal of the woreda divided by the total sale of the year and multiplied by hundred. Tarcha is town administration in the zone.

3.2. Methods of Data Collection

Both primary and secondary data were used for the study. The primary data were collected from sampled coffee producers and traders by using structured and semi-structured questionnaires and by informal survey. Separate questionnaires were designed for sampled farmers and traders. Questionnaires were pretested before the actual data collection practices. In addition to the questionnaire, an informal survey take place in the form of visiting Oysa Dawuro multipurpose cooperative union coffee dry processing station, local traders coffee purchasing market centers, their storage area and selling practices in the transaction. For necessary primary and secondary data collection any relevant data source organizations are consulted as key informant to obtain appropriate information.

3.2.1. Informal Survey

The purpose of this survey is to get firsthand information and better insight about the area to plan effectively to conduct the subsequent formal survey. In this survey, the relevant institutions and their experts who work on as an expert on coffee have been consulted using procedural checklist. In addition free informant interview on focus group discussion have been also undertaken to gather relevant information that can be used for appropriate site selection and designing of relevant questionnaire for the subsequent formal survey. Focus key informant organizations experts used in free discussion at this point are, Dawuro zone agricultural, trade and industry, marketing and cooperatives departments, cooperatives union and farmers who live in nearby forest coffee production site randomly selected 2 individual households from each kebele are interviewed for free information.

3.2.2. Formal Survey

After completing the informal survey and getting all of the relevant data inputs, the formal survey has commenced by purposive selection of 9 kebeles out of the 29 in the Woreda based on the extension of the coffee forest belt in which the coffee is grown and by its production potential, because forest coffee producer kebele in

the woreda are 9 in number. For survey data collection, 5 enumerators who have direct relation to the community, working experience in the kebele and graduated first degree in field of agriculture selected by researcher and has been trained on the content of the questionnaire and the type of data required to be collected. After creating clear understanding for the enumerators, the questionnaire was pre-tested using a pilot survey in 2 kebele before the actual work started under the supervision of the researcher for two days. Then necessary readjustment were made and the field survey conducted by the enumerators under the supervision and practical survey performing of the researcher. The identified forest coffee producers in 9 kebele are 240. Out of the 240 forest coffee picker households, 150 households were selected by simple random sampling techniques and interviewed from 9 kebeles by using a semi structured and structured questionnaires.

3.2.3. Secondary Data Collection Methods

In order to obtain the evidence of forest coffee production and marketing channel in the area, annual and progress reports of Dawuro Zone agricultural, marketing and cooperatives department, Oysa Dawuro multipurpose cooperative union, Ethiopia commodity exchange (E CX) Wolayta Sodo branch report on Dawuro zone coffee transaction to international market in year 2013/14 of preliminary unwashed coffee quality assessment No 012549, 223042 and coffee quality inspection test result certificate No 22-260517and 20-91659 of the same year un published reports and other documents revised. In addition Essara woreda agricultural, marketing and cooperative, microfinance, trade and industry office annual reports are revised. The relevant institutions data such as, research findings and working papers etc., which are relevant to the topic, have been revised and the important data which is essential to this research are properly used and cited.

Focus group discussion arranged by using 8 to 12 focus group members in one focus group and in each 9 kebeles 18 focus groups have been contacted. The foucs group compositin depends on group mebers education, age and sex level of diffrences, such as:

A. Both male and female and aged from 15-30 years old and educated people are one group and similar age and sex but non educated people are considerd as anther group and first foucs group to be intrvewed and group disscution take place.
B. The second foucs group arrengment composition includes both male and femal and their age between 31- 64 years old and educated people are one group and similar age and sex but non educated people are considerd as anther group to be contacted and in simelar way the respondants foucs groups aged above 65 year also.

Figure 2: Focus group discussions in Sengety and Nada kebele field survey, 2014.
Source: Own survey result, 2014

3.2.4. Sampling Methods

Sampling techniques applied in this research is, both informal and formal survey conducted to collect the relevant data in the area. Informal survey is used to obtain source of information how forest coffee produced and marketed in the area and to identify producer household willingness to respond formal survey questioners. Method used for informal survey conducting is indirectly contact the actors, and indirectly observing level of production and marketing of forest coffee. Method used to conduct formal survey is dirtily contacting and interview each actors by researcher and enumerators. The number of kebele in the woreda is 29, out of this 22 kebele are coffee producer and 9 kebele are forest coffee growers as the data obtained from Essara Woreda agricultural office. Under the 9 kebele the population and household's number varies 429 to 1,136 per kebele and the size of population and households are 30,115 and 6,146 respectively. The purposely sampled populations of forest coffee producers in 9 kebele are 240 household coffee pickers averagely exist in the area as the data obtained from field survey and Essara Woreda agricultural office socioeconomic data. Hence, out of 240 coffee pickers in the woreda, 150 forest coffee pickers selected by simple random sampling techniques and interviewed

10 to 25 respondents from each 9 kebele because both producers exist in nearby coffee forest and total producer size is small in number. (Table3).

Table 3: Forest coffee producer households' distribution selected for interview depending on their production potential and producers size

Woreda	kebele	Agro ecology (potential)	Total HH in kebele	No coffee picker HH	Sample/ kebele	Altitude (m)
Essara	Nada	Middle altitude	1136	40	25	1,601
Essara	Sengety	Middle altitude	738	40	25	1,853
Essara	Yinbira	Middle altitude	601	30	15	1,740
Essara	Zadishemite	Middle altitude	663	30	15	1,503
Essara	Daliba	Middle altitude	608	20	15	1,813
Essara	Hageli	High altitude	786	30	15	2,006
Essara	Gudumu	High altitude	755	30	20	2,431
Essara	zadiwoyda	High altitude	430	10	10	2,085
Essara	Guza	High altitude	429	10	10	1,999
	Total		6146	240	150	

Source: - own survey data in each research conducting kebele

In addition, to find sample size criteria, for specifying a sample size of the study area and to determine the appropriate sample size, the level of precision (sampling error is ±5) and confidence is 95% confidence level that is, 95 out of 100 samples will have the true population value within the range of precision specified. Therefore in this research the sampling technique is used Yamane, (1967:886) provides a simplified formula to calculate sample sizes. The formula used to calculate the sample sizes is A 95% confidence level and P = 0 .05 assumed. Then the formula used is

$$n = \frac{N}{1 + N\ (e)^2}$$

Where n is the sample size, N is the population size of forest coffee pickers, and *e* is the level of precision. When this formula applied to the above sample of Essara woreda forest coffee producers, we get:

$$n = \frac{N}{1+N(e)^2} = \frac{240}{1+240(0.05)^2} = 150$$

Therefore, in this research, 150 household coffee producer (picker) farmers have been interviewed from nine kebele.

To identify the level of forest coffee trading and marketable surplus and consumption in the area, and its transaction root, traders at different trading level and destination were interviewed to collect date. Therefore, 10 local coffee collectors, 10 local trader 5 Wolayta Sodo and, 5 Jimma town administration wholesalers purposively selected because they are few in number and 20 household consumers, 20 roadside, café and hotel brewed coffee consumers 10 roadside and 5 café and hotel brewed coffee supplier or sellers interviewed by simple random sampling techniques.

3.3. Method of Data Analysis

Qualitative and Quantitative descriptions by using chi^2 test, frequency percentage and cumulative percentage have been employed to describe the coffee chain and actors along the chain. Descriptive statistics was used to explain that the socio demographic characteristics of the actors, mean, standard deviation and percent etc. in the channel. Market concentration was calculated by HHI (Her find Hirschman concentration index) the regression analysis takes place OLS (leaner regression) by using STATA and SPSS software version 12 and 20 respectively.

3.3.1. Model Specification for Analysis

Linear regression analysis was used in this research to assess the association between two or more independent variables and a single continuous dependent variable. Because the dependent variable is one and the independent variables are more than two as the survey data. The single dependent variable was used in this research was volume of marketable surplus of forest coffee produced and marketed per household in quintal or 100 kg. The produced amount of market surplus in house hold is sold except few amount consumed in producers HH**.** The reason is coffee is cash crop and the objective of producer is to sale it rather than direct consumption. The independent variables are more than tow and the appropriate model is liner regression model. The linear regression equation for analysis used is that:

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i$$

yi = is the dependent variable that is the volume of marketable surplus of forest coffee produced in the area per

each household level and it measured by 100 kg and *xi* = is the independent variables. The coefficient β_0 is the intercept while, β_1 is the slop coefficient

That is *yi* changes by β_1 units for every unit change in *xi*

$$\frac{dy_i}{dx_i} = \beta_1$$

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \ldots \beta_n x_{in+} \varepsilon_i$$

Where (i = 1, 2, 3…13)

y_i = the total volume of marketable surplus forest coffee produced
x_{i1} = the average family size participated in coffee production
x_{i2} = forest coffee producers HH education level888
x_{i3} = age interval of forest coffee producer HH
x_{i4} = sex of producer HH head
x_{i5} = Active working age interval of producer HH
x_{i6} = Distance of market center and all weather road
x_{i7} = Off farm income generating source of producer HH
x_{i8} = Institution providing appropriate service delivery
x_{i9} = Forest coffee production and marketing experience of the producer
x_{i10} = Factors that encourage deforestation
x_{i11} = Decision maker in the family
x_{i12} = Coffee selling time schedule
x_{i13} = Forest coffee transaction without mixing garden coffee
εi = the i[th] observation of the stochastic error term
$\beta o, \beta 1$ = is the regression constant and slop coefficient
n = the number of sampled regress

3.3.2. Definition of Variables

There are different factors which affect the volume of forest coffee production and marketing surplus supply in the research conducting area. Some of them are distance of all-weather road, production site, market center inaccessibility, local collectors and traders setting the purchase and selling price of forest coffee and producers forced to accept the price at farm get. Coffee forest owned by communality without any governing rule, harvesting poor quality coffee cherry, mode of production system, measuring unit and women's role in coffee production, processing, marketing activities performance and their benefit share level not defined clearly in the channel are some of it. The important factors are education level of households, income generating capacity and source of households, family size of house hold and others have been analyzed in the relation to the households' socio-demographic, economic, educational level and spatial characteristics of the forest coffee producers in the channel.

3.3.3. Dependent Variables

The Volume of market surplus of forest coffee produced and marketed per household: These dependent variables is continuous dependent variables and measured by amount of quantity produced and marketed in the area per HH and its measuring unit is quintals or 100 kg for forest coffee producers, traders, roadside, café and hotel boiled coffee sellers. Therefore, leaner regression analysis model is used to analyze the volume of market surplus forest coffee production in the area and its transaction channel and factors that affects the volume of market surplus production and marketing.

3.3.4. Independent Variables

The Independent variables are the variables under the control of researchers. These are directly controlled or manipulated during a study or an experiment period by the researcher. The independent variables in this research includes:-

Family size of household (FSOHH): This is independent continuous variable measured in number of persons of the household consists. The larger size families require more amount of income to their livelihoods and participate in forest coffee production (picking), sun dry processing until final selling highly as compared to

small size family. As a result, for large size family, participating coffee picking and dry processing activity is simple than small size households. Thus, the larger family size measured by 1 if single house hold 2 if 2 – 5 family and 3 if 6-8 family members and 4 if 8 and above in the family and positively determines the volume of production and marketing level of forest coffee per households. Given the state of technology and other factors of production, the higher the amount of labour utilized the higher the level of output (Desta, 2004). The existence of a large family size is expected to negatively influence when the dependency ratio of the household was high (Tesfaye, 2003).

Educational level of the Household Head (EDLHH): It is independent continuous variable measured by producers and traders attained grades level that is measured by 1 if no formal educated, 2 if 1-8 grades, 3 if 9-10 grades, 4 if 11- 12 grades, 5 if certificate and above and expected to have positive or negative effect. This is because educated households are more informed about forest coffee current demand, consumers preferences, international and domestic market situations, resources utilization and rising of financial funds for their better production and to increase quantity produced than non-educated HH. Though they use forest coffee produces as cash generating sources properly as compared to non-educated HH. Educated HH practices consciously as compared to non-educated one. Education is believed to be an important feature that determines the individual forest coffee producer attitudes positively or negatively, whether to increase quantity produce or not in the area by relating its benefit level. Education can be a means of improving productivity and to raise incomes of the households (Tesfaye, 2005).

Age of the household head (AGEHH): Is continuous independent variable measured by number of years and it expected that the younger farmers are more active to travel on foot to coffee forest and perform better than the old farmers to increase the volume. While, the older farmers are more experienced than the younger one in their forest coffee production system adoption and management skills through long year experiences and has more indigenous knowledge they practice in the area. It measured by 1 if 15-30 years old 2 if 31-64 years old 3 if 65 and above years old. Therefore, age can determine the experience of the producers and its production and marketing quantity positively or negatively. Most young family members made independent decision to participate in production and marketing and it is expected to have positive relationship labour (Solomon, 2004).

Gender of the household head (**SEXHH**): It is a dummy variable taking one for male-headed HH and zero for female-headed households. The variable determines the quantity of market surplus produced, marketed and income owned in each HH level. In some HH, both male and female, take part in forest coffee production (picking), processing and marketing. However, the role of female and their contribution in quantity value augmenting activities such as coffee cherry picking, sorting, draying, grading, storing in local store is not less than their counterpart's male due. Decision making depends on accessibility of individual household heading chance ether male or female in the family. The decision maker has full of right and authority either to produce or not and owning the income generated from forest coffee. However, obstacles, such as culture of the society and lack of access to institutional support such as credit, access to extension service delivery, etc. may affect female participation '(Tanga, 2000). Therefore, female decision role to produce forest coffee, marketing and own the income from it may be affected by their household heading opportunity. Female-headed households have less access to improved technologies, credit, land and extension service (Green *et al.,* 1993; Ellis (-1992) cited by (Techane, 2002).

Market center and all-weather road distance (MRDHH): is continuous variable measured by km and that determines forest coffee producer's production and marketing efficiency and performance. It measured by 1 If 0-2Km, 2 if 2-4 Km and 3 if 4 Km and above faraway. The forest coffee production site distance is longer in km for producer, they discouraged to produce it because it is bulky produce to transport wet cherry and it can reduce the volume of market surplus and as market center distance longer and longer, coffee producers demand, to transport their produces become lower and lower. Since distance matters transporting their coffee to market places and they forced to sale in lower prices for local coffee collectors and traders. Therefore, market place distance negatively affects the coffee price and producer household income generating capacity as result producers may reject production and it also may reduce the volume of the produce. Market and other public infrastructure may create opportunities of more income by providing non-farm employment and access to transportation facilities (Tesfaye, 2005).

Off farm income generation (INCOM): This variable is measured by Birr and the source of off farm income were an individual household generated income for their livelihood. It used as additional cash income-generating capacity and ability of coffee producer households from off farm activities in the research conducting woredas. The outcome my affect directly or inversely the coffee producer (picker) farmers. Because, as means of income generation source of forest coffee producers become lower from off farm, they face challenges and become economically poorer and poorer. While, to coup up the challenges related to economic problems, the low income group farmers actively participate in forest coffee production and can increase the volume of market surplus in the area. Since, forest coffee is communal resource and cash crop that used as income generating

source in the area for forest coffee producer farmers. Off farm income generating activities is better endowed with additional income (Tesfaye, 2005).

Institution providing appropriate service delivery (INST): is continuous variable which takes 1 if forest coffee producer obtain appropriate inputs supply and extension service delivery from institutions such as Partner companies, agricultural department and offices, cooperative, marketing department and office, primary cooperatives, cooperative union, credit from financial institution in the woreda at farm get level and 2 if poor service delivery 3 if no service delivery at all. The services provided by institutions are such as inputs supply, providing credit, market information, and market facilitation to encourage coffee pickers. With help of institutional facilities, producers encouraged to improve market surplus of forest coffee production and marketing efficiency in the area and it increase the quantity produced, at household level. Linkages between cooperatives have resulted in improved coffee quality and operational efficiency. Cooperatives collaborate in contracting for transportation and warehousing services and share market information (Jim Dempsey and Ruth Campbell, 2010).

Level of deforestation and factors that encouraged deforestation (FACTOR): it is categorical variable measured by 1 if there is high deforestation for the last 20 years and factors aggravate deforestation related to expansion of farm land by illegal farmers, and settlement program farmers, and 2 if low deforestation for the last 20 years and its factor is fuel wood consumption demand increase and 0 if no deforestation for the last 20 years. It limits the natural forest coffee production and productivity directly. Meanwhile as deforestation increase's, forest coffee population will be decreases and coffee forest resource is also decreased. It affects amount produced and has negative impact on coffee productivity and quantity volume addition. The study depicted existence of significant difference between the strategies in the level of conservation cost components incurred at household as well as at institutional level (Assfa, 2005).

Coffee selling time period (CSTP): is a categorical variable measured by time schedule that the producers can seal early harvesting or not their produce in the area. It takes 1 if the producers sale it by chip price, 2 if they sale it by moderate, and 3 if they sale it by when the market price is getting expensive. Income generated from forest coffee determines individual forest coffee producer's decision to produce quantity of marketable surplus of forest coffee and its selling time schedule. If the forest coffee selling price is advantage for producers, they encouraged producing and they increase the quantity of marketable surplus of forest coffee in household level, and if the price is not benefit for producers, they reduce production and quantity supplied. Therefore, selling price has both negative and positive influence in market surplus volume addition and supply in the channel. The result of marketing costs, margin and benefit analysis imply that coffee collectors incurred the lowest cost than coffee producers bear the highest cost followed by wholesalers (Dessalegn, *et al.,* 2014).

Price setting (SAT): forest coffee selling price set by either by producer or by different level traders. It is categorical variable, measured by identifying price setter from producer and group of traders in forest coffee production and marketing channel. The coffee price can affect production of marketable surplus volume, positively or negatively, and it measured by the amount of birr that picker's sale a 100 kg coffee and it take 1 price of forest coffee greater than 700 birr per 100 kg and set properly by producers, advantages for producers, then the producers encouraged to produce it and increasing the volume of market surplus production, and it takes 2 if the price is set by traders group and less than 700 birr per 100 kg and discourage the producers, they reduce production and quantity volume supply to the market. Theoretically, price of the product is promising; producers are interested to take their product to the market. This makes the supply to be directly related to the current market price (Wolelaw, 2005).

Forest coffee selling with /without mixing garden coffee (MIX): it is dummy variable and measured by taking 1 if producers and traders seal forest coffee without mixing to garden coffee and consumers purchase pure forest coffee as it is, and otherwise it takes 0 if it mixed to garden and semi garden coffee. Mixing forest coffee with garden coffee may reduce the coffee organic quality and also consumer's demand of preference and it may also reduce the produce selling price. Therefore the price reduction may result discouraging the producers and it also reduces the volume of market surplus production in the area.

4. RESULTS AND DISCUSSION

4.1. Determinants of volume of Market Surplus production and its price

4.1.1. Dependents in the Family

In producer household, the large share of production and processing activities performed by family labor. Labor force should be physically and mentally active enough to participate in production (picking) from natural coffee forest as far as transportation or walking long distance from residence to coffee forest and from coffee forest to residence and market center is concerned. Producer households are economically poor and face capital shortage to employ a hired labor for coffee production, processing and marketing. Farming system of forest coffee producer is by large depend on family labour and most of the producers family members dominated by dependents. The survey data analysis indicates that out of forest coffee producer 95.3 % has 4-7 children and

4.7 % has 8-11 children in the family. The dependency ratio increasing in the family affects forest coffee producer's volume of market surplus production. 98 % of households have on average 1-4 dependents (blow 14 and above 65 years, 0.7 household has 5-6 dependents and only 1.3 % household has no dependents in the family. Active working ages on average 2 and 3 persons in the family are 99.3 and 0.7 % respectively. This implies that forest coffee producer household extremely affected by increased number of dependents and the volume of market surplus production and marketing also affected the dependents increment in the family. Therefore, intervention suggested is running the activity by haired labour is important.

4.1.2. Distance to Coffee Forest, All-Weather Road and Local Market Center

The coffee forest, market center and all-weather road distance determine forest coffee production and marketing efficiency and performance negatively in the area. Because as production site, all-weather road and market center distance become far away from producer farmer residences, it creates time consuming, produce loss and cost increasing due to its blackens. Producer who has no opportunity to transport coffee cherry by animal back and other means of transportations face challenges related to distance. Therefore, as the survey data analysis indicates that out of the total producer farmer's 98 % producer from coffee forest distance is on averagely 0.0-2 km and the remaining 0.7 % far away from 2-4 km and 1.3 % are above 4 km on average respectively. Out of the total producers, 20 % use to transport their coffee cherry from coffee forest to home by pack animal and the remaining 80 % used to transport their own labor. Out of the total producer,73.3 and 26.7 % producer transport their coffee to Balle and Kanbo local market center 3-6 and 2-4 km respectively and only 82.67% producer use donkey 16 % use mule and 1.3 own labour to transport their coffee cherry and significant at 10%. All weather road distance affects coffee producer farmer marketing and market information, they exposed to transportation cost, premium price loss, and totally the producers exposed to local coffee collectors and trader's price exploitation. The survey data indicate that out of the total producer 96.7 % far away from all-weather road in between 60-65 km and only 3.3 % are far away above 70 km on average. Pack animal owned by individual house hold play a great role in forest coffee value addition by transporting coffee cherry from its production site to home and from home to market place. Out of the total producer 84 percent own Donkey's 16 percent mule this show as the large share of forest coffee producers are poor and own dinky rather than mule. While, Transport method and market distance determine forest coffee producers selling price and reduce cost of coffee in local market. Out of the total producers used to transport their coffee produce to local market by pack animal is averagely 85.3 percent and those who use their own labor is 14.7 percent. Produces who have not own pack animal, suffer to pay additional cost for pack animal owners to transport the produce. Therefore, the main determinants for the forest coffee value addition in the area is production site, market center, all-weather road distance, and not owning pack animal are some of it. The possible intervention needed in the area is opportunity market center access establishment is very important.

Table 4: Coffee forest, market center, all-weather road distance and means of transport, 2014

Activities	N	%	Pearson chi^2
Coffee forest distance			
0-2 km	147	98.0	
2-4 km	1	0.7	
4 km and above	2	1.3	
Total	150	100.0	
Means of transport			
Transport by mules	24	16	
Transport by donkey	124	82.67	
Other means	2	1.33	
total	150	100	24.3301***
Market center			
Balle local market center	110	73.3	
Kanbo local market center	40	26.7	
Distance to all-weather road			
60-65 km	145	96.7	
70 km	5	3.3	
Type of pack animal			
Donkeys	126	84	
Mule	24	16	

Source: Own survey results, 2014

**** Statistically significant at 10% level*

4.1.3. Access to Extension Service Delivery

Forest coffee producer production capacity and, market information affected by, appropriate extension service delivery supplied by chain actors such as development agents in producer nearby and the woreda expert

technical support. Out of the 150 producer sample 97.3 % can obtain extension service delivery from own kebele 1-2 development agent services on once a year during coffee harvesting season and the remaining 2.7 % obtain all rounded appropriate extension services including appropriate inputs to produce and process their coffee and marketing it. This implies that according to the survey respondents view, extension service delivery provided for forest coffee producers in the area once in a year is related to the producers was given less emphasis by the responsible body and the serves is not sufficient to improve the production performance of market surplus in quality and quantity. Therefore, it also needs important intervention strategies to make the producers to be efficient.

4.1.4. Forest Coffee Production and Marketing Experience of Households

Forest coffee production experience of the individual producer can influence its productivity directly or inversely. Because long time period experienced farmer has better understanding in production system than the short period experienced farmers and Vic versa is true for short period experienced farmers. Therefore, the survey data analysis result indicate that out of producers 1-5 year 6-10 year,11-15 years and above 16 years production experienced household on averagely 4.7, 93.3, 0, and 2 % respectively. The data result implies that more share of forest coffee production experience age lies between 1-10 years.

4.1.5. Level of Deforestation and Its Effect

The level of deforestation in research conducting woreda is too high and totally it affects natural coffee forest belts currently. Deforestation and its impact in the woreda caused by two main reasons:

1) Legal deforestation which takes place by woreda level and kebele level local government decision, and practically distributing natural coffee forest land to settlement program and expansion of cultivable land by the settlement villagers.
2) Expansion of farm land by illegal farmers is the main one. The survey data analysis indicate out of the forest coffee producer households interviewed 100 % agreed that deforestation is highly increasing for the last 20 years and the main factors that aggravate deforestation in the woreda related to expansion of farm land by illegal farmers, villagers and other residents pressure by seeking forest products for fuel and furniture's. Out of the respondents 44 % argue, expansion of farm land by settlement villagers, 55.3 % and 0.7 % is argued that changing coffee forest area to farm land and semi forest area by the residents. Unless deforestation properly controlled in the area, total coffee forest belts fall on high risk and in near future totally forest resource will be completely degraded and forest coffee and other resource will be totally non-productive in the area see (Appendix table 8 and figure 10).

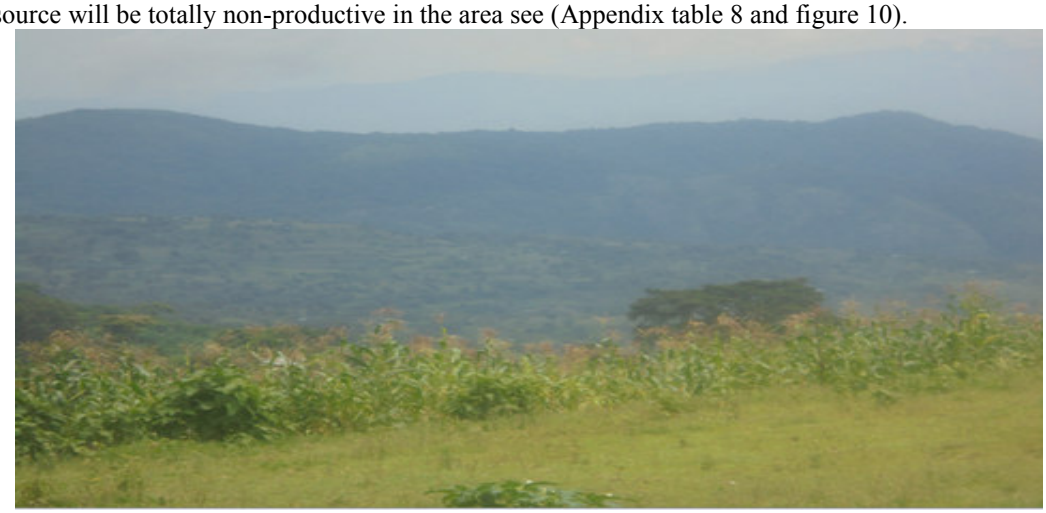

Figure 3: Legal deforestation of coffee forest in Essara woreda Neda kebele
Source: Own survey, 2014

4.1.6. Coffee Forest Management Problems

Coffee forest recourse owning and management is the main problem of the area, because forest coffee owned by community without rule and regulation in the area and each individual person can use the resource as he/she can. The large size and active age family members produce more coffee and can get large share of its benefit. While small and inactive age family groups produce small share. It results unfair competition between the producers, inefficient resource handling and benefiting from it. The inefficient resource utilization is related to communality problem and aggravates competition between producers to use more. It related to that mismanagement of the coffee forest belts and lack of governing rule how to use and manage the resource in the area. It also affects the quantity supplied of the produce to the market. Therefore, it requires appropriate intervention by responsible body (Figure.11).

The finding is in line with Adugnaw, 2014. 'More people generally lead to an increasing demand on

land for living and for agricultural production. The situation got more severe in when large numbers of people moved to South West Ethiopia in scope of organized resettlement programs. Consequently the pressure on the forest resources themselves increased due to a higher demand on fuel wood and construction timber. Finally, uncontrolled logging and the illegal export of wood stems to urban centers is a threat for the natural forest of the country.

Figure 4: Natural coffee forests belt legal deforestation in Gudumu and guza kebele in year, 2014
Source: own survey, 2014

4.1.7. Market Service Delivery Providing Institution Accessibility

Access to functional primary cooperative and cooperative union services in forest coffee produce transaction is very important to get appropriate price. Forest coffee market and marketing system facilitation, plays a great role in coffee transaction to add its volume and its value. The woreda marketing system related to price fluctuation depending on regional, central and international market price variation due to its quality and standard level. Therefore, functional institution on marketing and supporting or enabling of the channel in the value chain of forest coffee in the area is very important to add its value. The survey data analysis in research conducting woreda indicate that out of coffee producer only 2 % producer has been obtained appropriate primary cooperative purchasing their coffee and supplying to union for the last two years and 98 % of the producer were out of obtaining primary cooperative purchasing and supplying to coop-union forever. Though, the producer exposed to local coffee collectors and traders price exploitation forever years, because of absence of appropriate institution. In the some way only 2 % of the produce transacted through cooperative union to central and regional markets and 98 % of the farmers produce transacted through informal marketing system to reach its local, regional and central market. Out of the total producer 98 % get poor service delivery for the last five years and only 2 % get suitable institutional service delivery. Lack of institution, limits coffee pickers market and prices, availability and service delivery of credit, warehouse, input supply, market information and others services performed by functional institution. The lack of functional institution affects its volume and value addition in the chain. So that it requires proper intervention.

4.1.8. Market Surplus

Supply quality and standardized Coffee cherry to local markets is determined by its pre and post-harvest management system, because in research conducting woreda individual forest coffee producer extract the natural resource commonly. The communality creates very high competition between forest coffee producers to extract more from his/her competent and it results matured and non-matured coffee cherry harvested and then its quality affected by harvesting methods. The total producer agreed they supply low quality coffee and they get less benefit from it. Factors that hinder its quality is, due to communality 58 %, due to pre and post-harvest management problem 16.7 percent, lack of quality standard information 9.3, high competition between coffee picker to get more coffee bean and 12 % is due to absence of rule and regulation how to use and manage natural

forest coffee resource efficiently. Therefore, possible intervention required to improve marketable surplus production efficiency and to increase volume is establishing the governing rule for producers is important

4.1.9. Trade Practice

Local coffee traders diversify coffee trading with other trade type, as the survey data show, that 75 % of the local trader mixes their trading practices with consumption goods and 25 % mixes with other commodities, road side, café and hotel boiled coffee seller mix with hotel services 33.3 % and 66.7. Wolayta and Jimma town wholesaler transact without mixing. All of the local traders, 60 % road side, café, and hotel boiled coffee seller, purchase coffee from local market. 40 % of roadside café and hotel seller' and100 % Wolayta and Jimma town wholesaler purchase from woreda level market center. 10 % of local trader, 100 % road side, and café and hotel seller used local measuring units (cup, glass and 100kg.) and 90 % local traders and 100 % of Wolayta and Jimma town trader use fiber (*Joniya* locally) 50 and 100kg bag. Local trader pay to purchase 100 kg none crashed sun dry coffee from producer suppliers on average 700 Ethiopian birr accounts 85 % and 15 % pay blow 700. roadside, café and hotel boiled coffee seller pay 4,500 birr per 100 kg crashed coffee and Wolayta and Jimma town wholesalers 100 % pay 1,200 Ethiopian birr for 100 kg non- crashed sun dry coffee. Amount of request to sale 100 kg of none crashed coffee for the next market is 1,800 Ethiopian birr. While, differentiation forest coffee produce from garden and semi-garden indicates 15, 13.3, 10 % and 85, 86.7, and 90 % local traders, roadside, café and hotel boiled coffee sellers, Wolayta and Jimma town wholesalers differentiate the produce by asking the producer and trader suppliers and differentiate the produce by looking its size respectively. 'Local traders and consumers call forest coffee '*Armiya buna aifiya'* in local language 'Dawurthewa'. Therefore, local traders and consumers can differentiate the coffee bean by looking its size and if it is forest coffee, bean should be very small and has smart size than garden and semi-garden, they call it '*Armiy buna aifiya'* by looking its size and if the coffee bean has very big size they call it local language '*Bakala or Moyea buna aifiya'* which is the produce of garden and semi-garden coffee. "the knowledge is indigenes."

4.1.10. Price Received

4.2. Coffee marketing

Producer farmer has no power to set the coffee selling price in the area. The survey data analysis indicate that only 8 % of selling price in local market set by local coffee trader and 92 % of coffee selling price is set by local coffee collectors in local market. Out of the produce 42.7 % purchased by local traders and 57.3 % is purchased by local coffee collectors. The motives for the farmer to sale the produce in Balle and Kanbo local market in Essara Woreda is market place distance nearby to the producer. While coffee selling price variability for the last 5 years in the woreda as the survey data respondents view indication, related to that, due to its organic nature its demand increased by 8.7 %, domestically hotel, café and road side coffee brewed entry in the coffee transaction increased by 88 % and 3.3 % local and international coffee traders entry in the market increment creates for the last five years price variability of the woreda coffee purchase and selling.

Table 5: Distribution of forest coffee purchaser customers and price setter

Participant & activities	N	Frequency	%	Cumulative %
Customer to by producers coffee	150			
Local coffee collector		86	57.3	57.3
Local coffee trader customer		64	42.7	100
Total		150	100	
Price setter	150			
Local traders		12	8	8
Local coffee collectors		138	92	100
Total		150	100	
Motives to sale the coffee in local market	150			
The market place is nearer to producer	150	150	100	100
Reason for Price variability for the last 5 year				
Demand increased because of organic nature of the coffee				
Because of availability of many hotels and road side brewed coffee venders and increased domestic consumption		13	8.7	8.7
Increased number of local & internationally		132	88	96.7
Coffee traders		5	3.3	100
Total		150	100	

Source: Own survey analysis results, 2014

4.2.1 Forest Coffee Marketing Trend of Essara Woreda

Forest coffee production and marketing system of the research conducting woreda referred as; there is market differentiation problem to sale the produce totally. Because some of the producer sale it as forest coffee, others

sale by mixing it with garden and semi-garden coffee and some of them don't know whether they sale separately or not. Therefore, out of the producer 29.3 % sale without mixing garden and semi-forest coffee, 42.7 % sale by mixing with garden , and 28 percent of the respondent don't know how they sale it. Therefore, to obtain premium price from the produce it needs appropriate quantity by its type and brand of market where it should be sold. The survey data indicates out of the producers obtains appropriate market to sale their produce by its brand is almost none and hence finding the problem is important to increase its quality related to its brand and to receiving premium price. Poor market information for the last five years obtained (yes response) is 94 % and international market information obtained (no response) is 6 % of the producer. The information source is development agents (DA) who serve the producers on the residence kebele and the type of information they get from DA is about local, regional, central and international market information even though the information obtaining frequency with related to DA is once in a year during coffee harvesting season. Their marketing system is poor and they does not get appropriate price for the produce on a given local market. Therefore, when the actual price of the produce become low in the local market, the producer sale in lower price because the transportation system and future market information availability is poor, so that they exposed to price exploitation on traders and local coffee collectors as the survey data analysis. Moreover, transportation and future market information, contract market poor accessibility creates producer farmer to sale their produce in lower price and increases exploitation by local coffee collectors and traders in the area. Out of the producers only 0.7 % has access contract market to primary cooperatives and 99.3 % producers have no contract market access at all. While, the total amount of surplus produce in the area averagely by the level of producer implies, 21.3 % of the producer produce 5-8 quintal forest coffee per year per household (5+8/2*21.3 = 134.19 ql), 57.3 % producers produce on average 9-11 quintals per year per household (9+11/2*57.3 = 573 ql), and 21.3 % household produce on average 12-20 quintal per year per household (12+20/2*21.3 = 340.8 ql) and totally 1047.99 ql on average produced according to the respondents. Whereas, the production system and marketing is poor in the area and it requires appropriate intervention to improve the produce marketable surplus volume and marketing opportunity.

Table 6: Distribution of forest coffee marketing, market information, its source and market surplus in Essara woreda, 2014.

Market type & information	Frequency	%	Cumulative %
Is forest coffee marketed without mixing garden Yes			
No	44	29.3	29.3
I don't know	64	42.7	72
Total	42	28	100
	150	100	
Market information access for the last 5 years			
Obtain poor information (Yes)	141	94	94
Obtain information (No)	9	6	100
Total	150	100	
source of information for producer			
Development agent (DA)	150	100	100
Type of information obtained			
Local, regional and central market information	150	100	100
Time interval to get information			
Once a year during coffee harvesting season	150	100	100
If no market information and expected price measure taken by producer is sale it at lower price	150	100	100
Contract market access			
Cooperatives	1	0.7	0.7
There is no contract agreement at all	149	99.3	100
Total	150	100	
Total amount of coffee produced per household			
5-8 quintals on average	32	21.7	21.7
8-11 quintals on average	86	57.3	78.3
12-20 quintals	32	21.7	100
Total	150		

Source: Own survey analysis results, 2014

4.6. Econometric Analysis

4.6.1. Regression Parameter Estimation and Model Specification for regression

What factors can determine the forest coffee production and market surplus or volume in the channel of the

research conducting woreda? To analyze this data, the data were separated in to three parts they are producer, traders at different level and consumers. Before analyzing to know the factors that affect market surplus volume increased or not, the data were cheeked whether it fit the model or not by using statistical tools. The tools that used to test normality; tested by kernel density, homogeneity of variance of the variable 4, Heteroscedasticity of p value is 0.2427 and the value for chi^2 in quintals is 0.03 and probability of chi^2 is 0.8585. To check the multi-collinearity affect the model or not VIF is run. After running regression and the result indicates the VIF is less than 10 and the tolerance of 1/VIF value is also not affect the model.

Factors that affect the volume of market surplus production and marketing in the area by HH producers are tested by leaner regression analysis and the output defined clearly as follows. The measuring unit of the volume of the produce is by quintal or 100 Kg. The variable used to the test analysis are, Age of the household head (AGEHH), Gender of the household head (SEXHH), Family size of household (FSOHH), Educational level of the Household (EDLHH), Market center and all-weather road distance (MRDHH), means and source of income generating or off farm income (INCOM), Institution providing appropriate service delivery (INST), forest coffee production and marketing experience of the household (FCPMEHH), Level of deforestation and factors that encouraged deforestation (FACTOR), Coffee selling time period (CSTP), Decision maker to produce, sell and own the income (DEC), and Price setting (SAT) are the variables defined to analyze the data for forest coffee producers directly to test. For the data analysis the econometric model leaner regression analysis is applied and the output is indicated in table 7 in detail.

Table 7: Factor affecting the volume of marketable surplus of forest coffee

Source	SS	df	MS	Number of obs	=	150
				F(14,135)	=	1.93
Model	21.41493	14	1.529638	Prob > F	=	0.028
Residual	106.8251	135	0.791297	R-squared	=	0.167
				Adj R Squared	=	0.0806
Total	128.24	149	0.860671	Root MSE	=	0.88955

quintals	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gender	.111593	1.008264	-2.09	0.038	-4.105497	-.1176891
Age	0.140472	0.260009	0.54	0.009	-0.37375	0.654688
Family	-0.09696	0.233013	-0.42	0.078	-0.55779	0.363866
Education	0.133158	0.117356	1.13	0.259	-0.09894	0.365253
Distance	0.637912	0.208654	3.06	0.003	0.22526	1.050565
Inst	-0.0697	0.249201	-0.28	0.78	-0.56255	0.423142
Income	0.103917	0.12683	0.82	0.414	-0.14691	0.354747
Factors	-0.35465	0.138659	-2.56	0.012	-0.62888	-0.08043
CSTP	0.058223	0.221835	0.26	0.793	-0.3805	0.496944
Set	0.194672	0.101014	1.93	0.056	-0.0051	0.394447
Mix	0.558566	0.239044	2.34	0.021	0.085811	1.031322
_Cons	-0.78274	1.359126	-0.58	0.566	-3.47067	1.905194

Source: own survey analysis results, 2014

4.6.2 Gender

The participation level of female and male in forest coffee pickier household indicates that female play significant role in each activity as compared to male. The beta coefficient of both activities performed by female implies that its P value is 0.009 and significant at 1% level. The regression analysis indicates that female performance in forest coffee production processing and marketing channel is sizable and it helps more in forest coffee volume of production and supply to market surpluses as compared to male. The indication of their role is that more work load is performed by female groups as compared to male in each producer households. The finding in line with Christopher, *et. al,* 2010. The benefits of women's participation in agricultural value chains are determined by their control of productive resources and household level decisions.

4.6.3. Age

Age of the forest coffee producers household play significant role in forest coffee production and marketing in the area. That means the bet coefficient of the regression analysis imply that 14% of the total producer is aged below 15 years and above 65 years and the remaining 86% are active working age groups. It is significance at 1% level and which implies that the participation level of producer household age varies between above 15 and blow 65 years and the experience of the producer play a significant role in forest coffee production and marketing channel to increase the volume of market surplus in the area. The finding in line with (Techane, 2002), older farmers may accumulate more wealth and experience than younger ones.

4.6.4. Family Size of Forest Coffee Producer Households

The large size family, participating in forest coffee picking and dry processing activity is simple than small size

households. Thus, the larger family size and low level of income positively determines the volume of production and marketing level of forest coffee per households, since production is the function of labor, availability of active working age labor per household. The beta coefficient of active working age labour per household implies that negative and which implies inactive working age holding family produce low volume of market surplus than more active working age group holding house hold and it is significant at 10 % level and family is the major and sole source of agricultural labour, and the finding is in line with (Desta, 2004).

4.6.5. Distance

Distance in this thesis includes that, forest coffee production site, local market center; regional and central market center, and all-weather road accessibility away from producer HH. The beta coefficient show as $\beta_{6\,x\,i\,6}$ = 0.637912 (64 %) and the P value is 0.003 and significant at 1% level. The regression analysis justifies that a unit kilometer increase in forest coffee production sit, market center and all-weather road distance affect the producers the volume of production and supplying of marketable surplus. The producers forced to sale in for local collectors and traders. That means 64 % of marketable surplus forest coffee produces transacted to local collectors and traders as result of distance and the some 64 % volume of coffee production affected related to production sit distance. As production site distance lesser and lesser the volume of forest coffee production become higher and higher, as the production site distance higher and higher the produce become lesser and lesser by considering other factors remain constant. If the market center and all-weather road accessibility near to the producers, they may not exploited by local collectors and traders. Because they directly supply to the market and can get appropriate price. The findings in line with Berhanu *et.al*, 2013 Physical access to market frequency of household heads was affected by infrastructure availability and the mean market distance is 5.54 km in SNNPRS, 4.36 km in Oromiya. Thus as distance increased by one hour, the probability of farmers supply " in SNNPRS has decreased by 2.3, and (Awol, 2010). Analysis of poultry market chain: the case of Dale and Alaba 'special' woredas of SNNPRS, Ethiopia finding indicates in order to arrive the nearest poultry market, producers must walk about 10 Km distance. Above all most sellers (69%) do not have price information of another market before they transact their produce. Lack of market access and absence and/or asymmetric information are the major constraints mentioned in deciding how much to produce and supply to the market"

4.6.6. Level of Deforestation and Factors That Aggravated Deforestation

The level of deforestation in research conducting woreda is too high and the main reason to be deforestation in the area too high is related to legal and illegal factors that aggravate deforestation for the last 20 years and especially for the last 10 years. The regression analysis output of the beta coefficient of deforestation and its factors that affect the volume of marketable surplus production and marketing in the area is indicates $\beta_{10}x_{i10}$ = -0.35465 or (-35.5%) and the P value is 0.012 and significant at 1% level. The negative sign of the bet coefficient indicates that the unit increase in deforestation (the measurement unit is ha) results that the volume of marketable surplus productivities and production reduced by 35.5 % in one hand and 35.5 % of factors that aggravate deforestation in the area are related to legal, and illegal deforestation or local government distributing coffee forest belts to settlement program people, illegal farming land expansion by farmers who live near by the coffee forest belts, and mismanagement of the forest by local government. It affects the volume of marketable surplus produce, by assuming the other factors made constant. The justification is inadequate handling the natural forest land by local governments and the responsible residence farmers in the area reduced the size of natural forest coffee and the volume of marketable surplus productivities. Therefore, it needs appropriate intervention by local governments such as organizing the farmers in participatory forest management and off farm income generating for indigenes farmers and establishing the governing rule for settlement program people is the most important intervention mechanism suggested.

4.6.7. Forest Coffee Selling Price

Most of the forest coffee produce is supplied to market to sale and few amount is consumed by producer household level. Price of coffee and its price setting power can influence the volume of marketable surplus production positively. The regression analysis implies that the beta coefficient of price setting power holder or $\beta_{13}x_{i13}$ = 0.194672 or (19.5 %) and the P value is 0.056 and significant at 5%. The justification is that as forest coffee selling price is advantages to producer, thy encouraged to produce it and the unit price (in birr for a kg of coffee) increased, the volume of marketable surplus produce increased by 19.5 % in quintal or 100 kg. If the unit price decreased the reverse is true. The finding is in line with "Demeke Tilahun 2007. Educational background, age, family size, land holding, terms of payment for red cherry influenced the price of coffee in the coffee marketing cooperatives negatively at statistical significance level of 5%, and 10%"level.

4.6.8. Mixing Forest Coffee with Garden Coffee

Forest coffee marketing experience of producers in the woreda categorized in to tow that is by selling the produce without mixing in garden and semi garden coffee and mixing with garden coffee is identified by the

survey. The regression analysis of the survey data indicates, the producers supply the large share of forest coffee in the form of its organic nature and less amount are supplied by combination to garden one. That is its beta coefficient show as 56 % of the area coffee supplied as forest coffee and the remaining 46 % supplied to the market by mixing to garden coffee. It reduces the area coffee quality and significant at 5 % level. The regression analysis indicates that mixing forest coffee to garden coffee to augment the volume strictly affect the quality and its selling price. Therefore, the finding is in line with.

5. CONCLUSION

To increase the volume of marketable surplus of forest coffee production in the area, the important activities were reduction of the bottle necks of producer which could have affects their production, processing and income generating capacity. The bottle necks include lack of infrastructure, commonly ownership of coffee forest, high competition among producers for resource, and application of poor technology (picking, collecting, transporting from coffee forest to residence, dry processing and until final marketing). Farmers perform bear too much workloads to augment the marketable surplus volume of forest coffee and yet they receive very low income as compared to traders. To overcome the existing problems of producers and to ensure sustainable forest coffee production, processing and marketing channel timely and appropriate intervention need to be taken by responsible stockholders.

Different scholars stated that, more than 60% of Ethiopian coffee is produced as forest or semi-forest coffee and undergoes value addition process, reach domestic and foreign consumers through the supply chain. Similarly, according to the finding, of this research out of marketable surplus coffee produce of Essara woreda, 76 % is can be considered as forest coffee, and the remaining 34 % semi-forest and garden coffee, supplied local market in formal and informal transaction system.

The socio-economic characteristics of the study in the area depict that factors that affect marketable surplus of forest coffee volume of production and marketing increasing in the Zone (Woreda) related to, family size, education level, age of the producer and traders, marital status, gender, and type of productive resources owning right of household head. These variables affect marketable surplus of forest coffee quantity produced and market value chain in different angels.

Moreover, the result of the study show that marketable surplus of forest coffee production and marketing volume of the woreda are affected by center and distance from all weather road, the level of deforestation and factors that aggravated deforestation, forest coffee selling price and forest coffee production and marketing experience of households. The producers walk on average 2.6 km for production site and transporting to home by loading coffee cherry and also transport it to local market center on average 3 - 6 km. Traders face that all-weather road accessibility problems and thy travel on average 62.5 km inconvenient road and pay high transport cost for traveling the produce from local market (woreda level) accessing to all weather road destinations and it increase cost of transporting and reduce profit of the traders.

Large family size household performs more coffee production and marketing value adding activities within short period of time as compared to small size family members. The reason to use family labour for producers in the area was, they have no opportunity to hire labour as result of capital shortage. Marriage in producer HH plays a significant role to increase family size that was participating in marketable surplus production. As the finding of the current research, local traders, roadside, café and hotel brewed coffee venders less need children labour as working force, compering to producers. The reason is they have opportunity to hire labour.

The performance of marketable surplus of forest coffee production and marketing reduction in the woreda is, related to the education level of household head and age of the producers. Because formally non educated producer and less experience age may practice poor production system and poor understanding on value addition and quantity volume increasing compered to educated and more aged household head.

The survey data analysis finding show that, forest coffee production and marketing value chain the large share of value addition activities performed by female groups. In the zone Oysa Dawuro multipurpose cooperative union more than 98 % of coffee dry processing activities performed by female, while decision makers are male.

The main reasons of forest coffee producers depend on forest coffee production and marketing is related to shortage of farm land holding even though, the zone and woreda has no shortage of farm land and its reason is related to fair distribution of land (equity) problem and it needs providing solution by responsible body. Off farm income generation capacity of the farmers is limited and they live under poverty for long period of time.

Local coffee collectors and traders rather than bulking, they have no obligation to possess its quality produce supply to the market. It creates quality reduction and still now the quality reduction practice in the area is not managed by any responsible body.

Forest coffee, sell with mixing garden coffee affect its selling price and its quality. Because, some of the producer sale it as forest coffee, others sale it by mixing with garden and semi-garden coffee and some of

them don't know whether they sale separately or not. It related to experience of traders.

The survey data analysis finding of current research local collectors and traders differentiate forest coffee from garden one, by looking its size, and if the coffee bean is forest coffee its size is very small and they call it by local language "***Armiy Buna Aifiya*****"** and if it is garden coffee its size bigger than the forest coffee and call it "***Bakala or Moyea Buna Aifiya*****,"** the differentiation knowledge is indigenous skill.

Different actors participate in forest coffee transactions and the entry barriers in the transaction mainly coursed by rule and regulation to fulfill the minimum requirements set by government of the country and working capital shortage.

Market concentration of forest coffee in Essara woreda is analyzed in comparison the difference between the value of a forest coffee produce on farm get level price it sold and producers benefit share they obtained and, the some produce selling price level by different level of traders. Market concentration share indicates 5, 9, 28.7, 5.92, 6.68, 0.68 and 2.79 % respectively of local collector, local trader, Wolayta Sodo and Jimma town wholesalers, primary cooperatives, Oysa Dawuro multipurpose cooperative union roadside, cafe, and hotel boiled coffee sellers and local consumers respectively.

Market margin of forest coffee in Dawuro zone (Essara woreda) analyzed by the selling price difference at different level actors. The output indicates that the gross, marketing, net and percent margin of local collectors, local traders, Wolayta Sodo and Jima town wholesalers, Oysa Dawuro multipurpose cooperative union, roadside, cafe and hotel boiled coffee sellers margin is analyzed and show as margin difference by each actor.

5.1. Recommendation and Policy Implications

Market surplus of coffee quantity volume production and supplying quality coffee affected by age, experience and education level of forest coffee producers. Therefore, the appropriate suggestion encouraging more experienced producers by creating incentive mechanism to sustain them in production process and educating producer farmer's literacy with related to adult education and extension communication system to fulfill their knowledge gap on forest coffee production and marketing is necessary.

Family size and active working age group holding family significantly affects the volume of forest coffee production and market surplus of forest coffee production and marketing in the woreda. The suggested strategy is awareness creation to less family size and inactive working age groups employ hired labour is appropriate.

Results of the survey show that the woreda forest coffee volume of production and marketable surplus is significantly affected by market Center and distance from all-weather road Therefore, as mitigation strategy local and regional government have the responsibility, to establish alternative market center near by the producers for efficient forest coffee transaction.

Accessibility to all-weather road influences both producers and traders in terms of surplus production, selling price and transport cost. Therefore, for any development strategy infrastructure is very critical point. The Zonal, regional and central government policy makers have responsibility to construct all weather roads by considering forest coffee and other resource potential of the woreda and its importance for country GDP growth.

As the finding of the survey data analysis the woreda forest coffee production and marketing volume of the surplus significantly affected by the level of deforestation and factors that aggravated deforestation in the woreda. The possible suggestion to reduce deforestation of forest coffee belts is, organizing producers in participatory forest management to handle the forest coffee belts and to increase productivity by creating in the society we filling is most appropriate. And off farm income source opportunity creation and reducing fuel wood consumption by replacing source of fuel on biogas and if possible electricity power replacing rather than consumption wood could be important suggestions. The local government has responsibility to prevent and protect legal and illegal deforestation. It is threat for total coffee forest belts including Chabarachurchura national park. Unless urgently prevention and protection action taken, by local governments especially the Zone and woreda administration. Otherwise the coffee forest is totally under risk.

The finding of the survey data analysis indicates that the volume of forest coffee production and marketing surplus significantly affected by its selling price. The suggested strategy is creating alternative market for producers and improving the transaction channel such as primary cooperatives and cooperative union capital and skilled human power shortage can reduce the producer's price exploitation. Price set by local collectors and traders rather than producers, and producers has no price setting power. Therefore they exploited by traders price decision power. Market channel indicates 98 % is transacted by conventional marketing system and only 2 % transacted through legal transaction it can affect the volume of marketable surplus and producer's income and fair price about the produce. Therefor to reduce informal market replacing by legal market is recommended.

To prevent less quality coffee supply in the woreda awareness creation for producers and establishing governing rule to producers about frost coffee resource utilization is the main one. It is the local government responsibility, and local government body must give attention about forest coffee quality considering its importance in international market.

Mixing forest coffee with garden coffee reduces its quality and price. The intervention mechanism suggested is legal forest coffee transaction center establishment and selling price difference for forest coffee from garden coffee in the locality is suggested.

The future line of work is that the current research doesn't cover all linkage of Dawuro forest coffee withe Kaffa natural forest coffee. Because the coffee forest belt has boundary sharing to Kaffa forest coffee through Chabara Churichura national park and to understand coffee originality farther analysis is necessary on its similarity and difference with Kaffa and Dawuro forest coffee on its originality

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Abstract
Forest coffee originates in Southwestern and Southeastern Ethiopia where 30% of production and 10 % to 20% of the country's total export originates from. The general objective of the study was to analyze the factors that affect the existing forest coffee value chain of Essara woreda with specific focus of identify the existing coffee market channel and actors involved in the chain, the structure and performance of coffee chain determinants of market surplus production, price received by coffee farm households and the role of gender in coffee value chain. To these end 235 sample producers, local coffee collector, local traders, wholesalers and consumers were identified from 9 kebele, Balle and Tarcha town for the study. Based on the findings of the study the volume of production and marketing were found to be affected by age, family size, market Center and all-weather road distance, the level of deforestation and factors that aggravated deforestation, selling price, experience of producer households and mixing forest coffee to garden coffee to increase the volume. About 2% of market surplus coffee is transacted in through formal market while, 98 % is through conventional market, as a result of which producer obtain less income and 98 % forest coffee producer's income source is depending on natural forest coffee production and marketing while, the level of deforestation is too high it needs appropriate intervention and awareness creation. The large share of forest coffee production and processing activities are performed by female groups in the channel while, owning productive resources and decision maker to produce, sale, own and benefit from the resource mostly go to male group. Market margin of the area indicated that the large share of benefit is concentrated at roadside, café and hotel coffee brewers and venders. Hence, in order to improve the profit margin and level of producers' benefit value addition and increase in sale price for their produce at farm get level is recommended
Key words: Essara Woreda, value chain, value addition, market

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